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A Critical Evaluation of Numerical Solutions to the 'Benchmark' Surface Flaw Problem

REPORT OF THE SESA FRACTURE SUBCOMMITTEE ON SURFACE FLAWS
J. J. McGOWAN, CHAIRMAN AND EDITOR
BENCHMARK EDITORIAL COMMITTEE, UNIVERSITY OF ALABAMA

Abstract: Recent precise, elastic numerical solutions to a surface flaw in a plate under remote tension and bending have been compared to arrive at a 'best estimate' of the stress-intensity-factor variation along the flaw border. The analysis methods used to determine the solutions included: Schwarz alternating technique, finite-element method and boundary-integral-equation method. The derived best-estimate curve for the stress-intensity factor is believed within 3-percent of the actual value along the crack front. The best-estimate curve compared well with scarce experimental data. (± 10-percent)

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M. E. Yergin, Society for Experimental Stress Analysis, 14 Fairfield Drive, Brookfield Center, CT 06805

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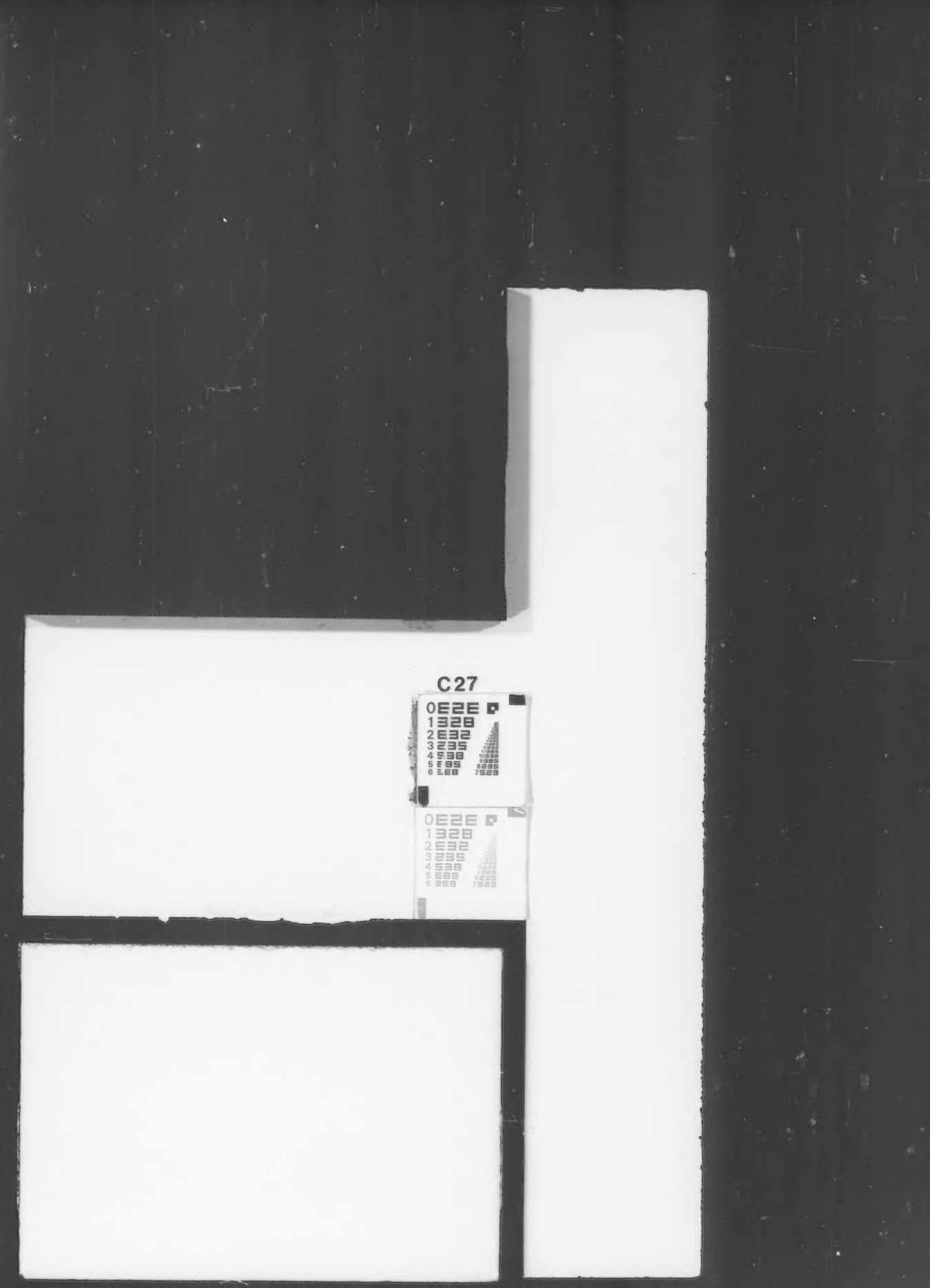
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